

McCLINTOCK, BARBARA, University of Missouri, Columbia, Mo.: *A method for detecting potential mutations of a specific chromosomal region.*—Plants having two deficient chromosomes-5 (the deficiency included the locus of Bm_1 , allele of bm_1 , brown mid-rib, producing a brown color in the lignified cell walls) and a small ring-shaped fragment covering the deficiency and carrying Bm_1 are mosaics of heterozygous and homozygous deficient tissues through frequent losses of the ring fragment during somatic mitoses. This homozygous deficient tissue is (1) much reduced in growth capacity, (2) contains no chloroplasts, (3) has the characteristics of bm_1 in its cell walls and (4) dries on exposure to sunlight. Relatively infrequently, during somatic mitoses, the ring chromosome increases or decreases in size through duplications or deficiencies of segments of chromatin composing the ring. Duplicated segments produce no obvious tissue modifications. If removal of specific regions from the ring results in homozygous deficient tissues having specific modifications, several types of mutant sectorials, depending upon the region removed, should be repeatedly encountered in large populations of such plants. The following types of "simple" mutant sectorials have been found: (1) transparent white with colorless cell walls, no plastids; (2) opaque white with colorless plastids, colorless cell walls; (3) deficiency- bm , similar in detail to normal bm ; (4) pink colored tissue with colorless cell walls, colorless plastids; (5) blotched chlorophyll pattern, colorless cell walls. The following types of "compound" mutant sectorials have been found: (1) pink, deficiency- bm , viable in sunlight; (2) pink, deficiency- bm , dries in sunlight; (3) opaque white, deficiency- bm ; (4) blotch, deficiency- bm , dries in sunlight; (5) blotch, dries in sunlight. On the theory that compound mutant sectorials are the product of losses of several adjacent regions of chromatin, the simple mutant effects are referred to the chromosome in the following order: pink, deficiency- bm , dries in sunlight and blotch, with translucent white removed from deficiency- bm and opaque white close to it. Since a homozygous deficiency for the Bm_1 locus produces the same effect as the known gene bm_1 , it is possible that these other mutants may eventually appear as "genes" closely linked to bm_1 .